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Prevalence of Medication Prescription Patterns for Iraqi Outpatients Visiting Otolaryngology Clinics

Mirna. K. Faiq
Department of Pharmacology and Toxicology, College of Pharmacy, University of Kirkuk, Kirkuk, Iraq, Ph.D. in Clinical Pharmacy, mirnakifah@uokirkuk.edu.iq

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ORIGINAL STUDY

Prevalence of Medication Prescription Patterns for Iraqi Outpatients Visiting Otolaryngology Clinics

Mirna. K. Faiq

Department of Pharmacology and Toxicology, College of Pharmacy, University of Kirkuk, Kirkuk, Iraq, Ph.D. in Clinical Pharmacy

ABSTRACT

Objectives: To assess the prevalence of drug use patterns among ENT outpatient settings in Kirkuk, Iraq.

Methods: This retrospective observational study was conducted in Kirkuk, Iraq, involving the collection of data from the e-Prescribing system and the review of written prescriptions, including 582 outpatient records from ENT clinics, from January 2024 to December 2024.

Results: Most patients were below 20yr age (18.73%), with a male predominance (57%). Ear-related complaints like otitis media were the most frequent (35.22%). The average number of drugs per prescription was 2.82. The percentage of prescriptions in which an antibiotic was prescribed was 84.7%. The percentage of drugs prescribed by generic name was 100%. The percentage of prescriptions in which an injection was prescribed was 8%, and the percentage of drugs prescribed by the Essential Drug List was 71.6%.

Conclusions: The average number of drugs per prescription, and the percentage of prescriptions in which an antibiotic was prescribed, are higher than the standard recommended by the WHO. The percentage of drugs prescribed from the Essential Drug List was lower than the WHO reference value. These findings highlight the need for continuing medical education to train the prescribers to adhere to the WHO standards for prescribing.

Keywords: Prescribing patterns, ENT, Drug utilization, WHO, Iraqi patients, Kirkuk

1. Introduction

Drug utilization is defined as “the prescribing, dispensing, administering, and ingestion of drugs” [1]. In order to assess the medications that are prescribed to patients, drug use evaluation is an ongoing, authorized, and systematic quality improvement procedure [2]. In the general population, ear, nose, and throat (ENT) disorders are prevalent [3]. These conditions can range from a common cold to a more complicated form of chronic suppurative otitis media [4]. All age groups are impacted by ENT disorders, which can interfere with daily life [1].

The ears, nose, and throat are more likely to become infected during summer or winter sessions. Ear infections, such as acute and chronic suppurative otitis media, are more prevalent. A runny nose and allergic rhinitis are frequent nose infections, whereas tonsillitis and pharyngitis are usual throat infections. When the environment abruptly changes, many illnesses worsen [5].

Every medication has both advantages and risks; for example, the ENT department currently uses a variety of drugs for various illnesses, including antibiotics, antihistamines, corticosteroids, decongestants, and analgesics [6]. Although the overprescription of antibiotics occurs globally, it is particularly prevalent in countries with low or middle incomes [7]. Complications from inappropriate usage of corticosteroids include headache, weight gain, immunosuppression, hip avascular necrosis, and hyperglycemia [6]. To improve therapeutic benefits and reduce side effects, prescribing practices must be informedly adjusted by routinely monitoring and assessing drug utilization patterns [8]. Asia has some of the most severe resistance problems [9]. The number of medications

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E-mail address: mirnakifah@uokirkuk.edu.iq (M. K. Faiq).

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prescribed per encounter, the percentage of generic drug prescriptions, the percentage of injectable encounters, the percentage of antibiotic prescriptions, and the percentage of medications prescribed from the essential drug list (EDL) are among the World Health Organization's (WHO) prescribing indicators [10]. The WHO created the AWaRe classification to highlight the significance of using antibiotics as efficiently as possible and to support antimicrobial stewardship initiatives. It divides antibiotics intended for systemic use into three different groups, Access, Watch, and Reserve, according to their therapeutic indication, spectrum of activity, and potential for antimicrobial resistance [11]. The justification for the essential medicines is that, even if there are many registered and available pharmaceuticals, it is crucial to be selective in order to ensure the safety, effectiveness, and affordability of these drugs while also taking into account the medical needs of the majority of the population [12]. In Iraq, numerous drug utilization research studies have been carried out in a variety of contexts and on certain demographics. None of them had, however, been carried out on ENT outpatients.

1.1. Aim of the study

To assess the prevalence of drug use patterns among ENT outpatient settings in Kirkuk, Iraq, based on WHO prescribing indicators.

2. Patients and method

2.1. Study population

The present investigation was a retrospective observational study conducted in Iraq, specifically in Kirkuk city. A consistent data collection sheet was created by methodically extracting data from both physical written records and the e-Prescribing system. Since this was a retrospective review, no in-person patient interviews were done; about 582 outpatient records included from ENT clinics, from January 2024 to December 2024. The **inclusion criteria** included all outpatients aged one year and above of either sex who were prescribed medication by the ENT physician. The **exclusion criteria** included outpatients who were not treated by the ENT department.

For a simple random sample, the following formula (Cochran formula) [13] was used:

$$n = \frac{z^2.p\,(1-p)}{E^2}$$

Where:
n = sample size
z = Z-value (e.g., 1.96 for 95% confidence)
p = estimated proportion (0.5 if unknown)
E = margin of error (e.g., 0.05)
$n = \frac{1.96^2.0.5(1-0.5)}{0.05^2} =$ *round to* 385 minimum calculated study sample. A total of 582 patients were included.

2.2. WHO prescribing indicators calculations

$$\textit{Average number of drugs per encounter} = \frac{\textit{Total number of drugs}}{\textit{Total number of the prescription}}$$

$$\textit{Percentage of drugs prescribed by generic name} = \frac{\textit{No. of drugs prescribed by generic name}}{\textit{Total No. ofdrugs prescribed}} \times 100\%$$

$$\textit{Percentage of encounters with an antibiotic} = \frac{\textit{No. prescription with antibiotic}}{\textit{Total No. of prescription}} \times 100\%$$

$$\textit{Percentage of encounters with an injection prescribed} = \frac{\textit{NO. prescription with injection}}{\textit{Total No. of prescription}} \times 100\%$$

$$\textit{Percentage of drugs prescribed from EML orformulay} = \frac{\textit{NO. of drugs prescribed from EML}}{\textit{Total No. of drugs}} \times 100\%$$

Antibiotics were further categorized into Access, Watch, and Reserve (AWaRe) groups based on the 2025 WHO Model List of Essential Medicines to evaluate the quality of prescribing patterns [11].

Access antibiotics having a limited range of action, fewer side effects, and a reduced risk of antimicrobial resistance.

Watch antibiotics more frequently administered to sicker patients in hospital settings and typically have a larger potential for the selection of antimicrobial resistance.

Reserve antibiotics are last-resort antibiotics that should only be used to treat severe infections caused by multidrug-resistant pathogens.

2.3. Ethical considerations

This study was conducted in accordance with the Good Clinical Practice standards and the Declaration

Table 1. Demographic Characteristics and Prevalence of ENT Conditions.

Age (Yr.)	N (Total) = 582	Percentage (%)
1–10	93	15.98
11–20	109	18.73
21–30	82	14.09
31–40	79	13.57
41–50	81	13.92
51–60	74	12.71
>60	64	11.00
Gender		
Male	334	57
Female	248	43
Diagnosis		
Acute or chronic otitis media	205	35.22
Allergic rhinitis	100	17.18
Otitis externa	84	14.43
Acute or chronic rhinosinusitis	62	10.65
Tonsillitis	42	7.21
Acute or chronic pharyngitis	15	2.57
Ear wax	14	2.41
Others	60	10.31

of Helsinki [14]. Furthermore, the protocol was approved by the Ethical Committee of the University of Kirkuk -College of Pharmacy, assigned the number (RECAUKCP2), and approved by ENT Specialists Clinics, while maintaining the confidentiality of patients' information.

2.4. Statistical analysis

Microsoft Excel 2019 was used for data management and descriptive statistical analysis.

3. Results

3.1. Demographic characteristics and prevalence of ENT conditions

This study examined 582 prescriptions in total. Patients between the ages of 11 and 20 made up the largest percentage of the patient population (18.73%), followed by those aged 1 to 10 (15.98%), and those over 60 made up the smallest percentage (11%). The gender breakdown showed that there were more male patients (57%) than female patients (43%). Otitis media was the most prevalent ear condition among the 582 cases (205, 35.22%). Nose disease, like Allergic rhinitis, is mostly common (17.18%), and tonsillitis (7.21%) is a common throat disease., as seen in Table 1.

About 323 patients (56%) had ear disease, 176 patients (30%) had nose disease, 75 patients (13%) had throat disease, and 8 patients (1%) had a combination of ENT illnesses, as seen in Fig. 1.

3.2. Patterns of prescription of antimicrobial agents in the ENT department

Ear illnesses accounted for the highest prevalence of antimicrobial therapy (61.4%), followed by nose (27.3%) and throat (11.3%). In ENT problems, penicillin antibiotics were most frequently administered (38.3%), as seen in Table 2. The patients' prescriptions revealed that 223 (45.23%) patients were on multiple antibacterial therapies, while 270 (54.77%) patients received antibacterial monotherapy, as seen in Table 3. Altogether 1642 drugs were prescribed, and the average number of drugs per prescription was 2.82. Out of 1642 drugs, the total number of antibiotics prescribed was 751. The average number of antibiotics per prescription was found to be 1.52, as seen in Table 4.

3.3. Patterns of prescription of Steroids, decongestants, antihistamines, and analgesics in the ENT department

Out of 582 prescriptions, 250 Steroids were prescribed. Betamethasone was found to be the most often given steroid (n = 73, 29.2%), followed by Dexamethasone (n = 55, 22%). About 61 decongestants were prescribed. Xylometazoline was found to be the most prescribed decongestant (n = 51, 83.61%). The most common antihistamine used was Loratadine (57.73%). Common concomitant analgesia prescribed was Acetaminophen (75.5%), followed by NSAID (29.5%), as seen in Table 5.

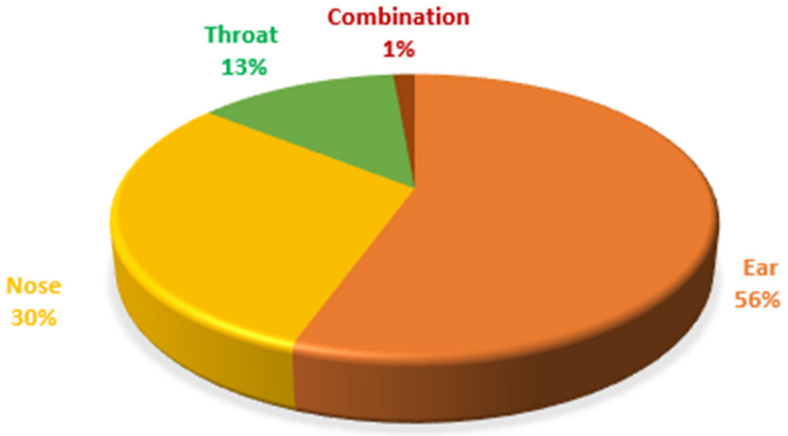

Fig. 1. Distribution of ENT diseases.

3.4. The World Health Organization drug prescribing indicators

The WHO drug prescribing indicators are displayed in Table 6. The present study revealed that the average number of drugs prescribed per prescription is 2.82, and antibiotics constituted about 84.7% of the prescriptions. All of the drugs were prescribed by generic name, about 8% of the prescriptions had an injectable drug, and the percentage of drugs prescribed by the Essential Drug List (EDL) was 71.6%.

4. Discussion

Studies on drug use have a significant impact on quality improvement and health policy [15]. In this study, the maximum number of patients belonged

Table 2. Patterns of prescription of antimicrobial agents in the ENT with AWaRe Classification.

Antibiotic Class	Ear (n.)	Nose (n.)	Throat (n.)	Total (n.)	Likely Route	AWaRe Category
Penicillins	153	83	52	288	Systemic	Access
Cephalosporins	87	48	7	142	Systemic	Watch (2nd/3rd Gen)
Fucidic acid	55	31	0	86	Topical	Watch
Fluroquinolones	83	2	0	85	Systemic/Topical	Watch
Nitroimidazoles	34	15	15	64	Systemic	Access
Aminoglycosides (gentamicin)	28	13	1	42	Topical	Access
Chloramphenicol	13	8	0	21	Topical	Access
Macrolides	3	1	8	12	Systemic	Watch
Tetracyclines	5	3	0	8	Systemic	Access
Lincosamide (Lincomycin)	0	1	1	2	Systemic	Watch
Sulfonamide	0	0	1	1	Systemic	Access
Total Agents	461	205	85	751		

Table 3. Frequency of Antibiotics used.

Drugs Prescribed	No. of Prescription	% of Prescription
Single antibiotic	270	54.77
Multiple antibiotic	223	45.23
Two drugs	179	80.27
Three drugs	43	19.28
Four drugs	1	0.45

Table 4. Prevalence of Drugs/Antibiotic Use.

Distribution of drugs/antibiotics per prescription.				
Total number of drugs	Average number of drugs per prescription	Total number of Prescriptions contains antibiotics	Number of prescribed antibiotics	Average number of antibiotics per prescription
1642	2.82	493	751	1.52

Table 5. Steroids, decongestants, antihistamines, and analgesics were prescribed.

Medications	No. of agents prescribed	%Consumption
Steroid		
Betamethasone	73	29.2
Dexamethasone	55	22
Quadriderm®(Beclomethasone + neomycin + clotrimazole)	35	14
Prednisolone	31	12.4
Mometasone	25	10
Hydrocortisone	17	6.8
Beclomethasone	8	3.2
Triamcinolone (Kenalog®in Orabase oint.)	2	0.8
Budesonide	2	0.8
Fluticasone	1	0.4
Clobetasol	1	0.4
Decongestant		
Xylometazoline	51	83.61
Pseudoephedrine	4	6.56
Phenylephrine	4	6.56
Naphazoline	2	3.28
Antihistamine		
Loratadine	56	57.73
Desloratadine	16	16.49
Diphenhydramine	2	2.06
Chlorpheniramine	13	13.40
Levocetirizine	3	3.09
Cinnarizine	7	7.22
Analgesics		
Acetaminophen	186	70.5
NSAID	78	29.5

Table 6. Comparison of Prescribing Indicators with WHO Reference Values.

Indicator	Percentage prescription	WHO reference values
Average number of drugs per prescription	2.82	1.6–1.8
Percentage of prescriptions in which an antibiotic was prescribed*	84.7%	<30%
Percentage of drugs prescribed by generic name	100%	100%
Percentage of prescriptions in which an injection was prescribed	8%	<20%
Percentage of drugs prescribed by the Essential Drug List (EDL)	71.6%	100%

*Percentage of systemic antibiotic prescriptions by excluding prescriptions that include topical agents as monotherapy: 79%.

to the 11–20 years age group (18.73%). Although another study in Raipur, India, found that most patients were between the ages of 13 and 35 (40.89%) [4], suggesting that the majority of ENT diseases are prevalent in children and young adults. Male patients were predominant (57%). This is consistent with other similar studies conducted in India [4, 6, 16] and Saudi Arabia [17]. Given that men make up a larger percentage of the ambulatory working population, it is likely that they are more exposed to environmental variables, contaminants, and infections [16].

The most often prescribed antimicrobial classes were β-lactams (penicillin and cephalosporins). However, another study at the tertiary care teaching hospital in Rajkot, India, found that fluoroquinolone was the most often administered antimicrobial [18]. In this study, it was observed that the average prescribing frequency of antimicrobials per prescription was mostly one (54.77%) and multiple antimicrobials in (45.23%). Another study conducted in India found that 30.88% of patients were receiving multiple medication therapies, and 69.11% of patients received antibacterial monotherapy [19]. A thorough examination of the data shows that the high proportion is impacted by the frequent use of dual-route therapy, even though the overall antibiotic prescription rate was 84.7%, which greatly surpasses the WHO standard of less than 30%. In particular, topical adjuncts like Fucidic acid and Chloramphenicol were regularly administered in addition to systemic antibiotics. This procedure guarantees high local medication concentrations at the site of infection and is frequently used in specialized ENT clinics. However, the high average number of antibiotics per prescription (1.52) is a result of this “layering” of antimicrobials, which calls for close observation to avoid needless polypharmacy. In comparison with other study in Nepal, found

that the average number of antibiotics per prescription was found to be 1.041 [20].

The observations indicated that the most commonly prescribed corticosteroids were Betamethasone 29.2%, and Dexamethasone 22%. Another study in Kanpur, India, found that commonly prescribed corticosteroids included dexamethasone (30.1%), triamcinolone acetonide + lidocaine (26.5%), and betamethasone-based combinations (24.8%) [6]. The most typical sign of both acute and chronic rhinosinusitis is nasal congestion. Therefore, nasal congestion might make daily activities more difficult. It was found that Xylometazoline was the most prescribed decongestant (83.61%). Similar findings have been documented in Saudi Arabia, where xylometazoline is most commonly prescribed [3]. Loratadine, an example of the second-generation non-sedating H1 antihistaminics, was the most often prescribed H1 antihistaminic (57.73%). This result is inconsistent with other studies, where Chlorpheniramine [8], Cetirizine [2], and Levocetrizine [4] were the most prescribed H1 antihistaminics. According to this study, acetaminophen was the most often recommended medication among analgesics (75.5%), which is a good indicator because it has the fewest side effects. NSAID came in second. This result is consistent with other study done in Raipur, India, where paracetamol (67.36%) was the most commonly prescribed drug [4] and inconsistent with other study that found Ibuprofen most commonly prescribed [5].

According to recommendations on proper utilization of medications, the average number of prescriptions is between 1.6 and 1.8 [21]. According to the current study, the average number of medications prescribed per prescription is 2.82, which is higher than the typical. In another study, the average number of drugs per prescription was also higher than the standard found to be 4.06 [22]. Less than 30% of prescriptions should contain an antibiotic, according to WHO guidelines [23]. Antibiotics made up around 84.7% of the prescriptions, while the rate is high, 56.5% of these were from the Access group, which is the preferred category for common infections. In comparison with other studies, it was found that antibiotics constituted about 17.5% [24] and 96% [22] of the prescriptions. The World Health Organization suggests that all medications (100%) should ideally be prescribed under generic names [23]. All of the medications prescribed in this study were generic names. Using generic names for prescriptions could lower overall drug costs. This result is inconsistent with other study where 33% prescribed by generic names [24]. The WHO has suggested that fewer than 20% should be the ideal percentage of prescriptions that include an injection [23]. In the present study, 8% of the prescriptions had an injectable drug; another study found that 70.83% of prescriptions were for an injection [22]. Because of their quick onset of action, injections are an essential dosage form in emergencies; therefore, a rise in their use could draw attention to these situations. However, overusing injections can result in psychological and physical discomfort as well as higher therapeutic costs. All medications should ideally be recommended from the EDL [23, 25]. In this study, the percentage of drugs prescribed by EDLwas 71.6%, while other studies found that the percentage of drugs prescribed by EDL was 76.7% [24] and 30.26% [22]. In order to ensure appropriate treatment, physicians frequently have to weigh the risk-benefit ratio for complex infections at clinics, which may require the use of drugs outside of the usual EDL.

In this study, only one governorate was covered. Expanding the study to include additional Iraqi governorates might yield more comprehensive data.

5. Conclusions

An excessive dependence on antibiotics and polypharmacy above WHO safety limits is seen in the current prescription trends in the ENT outpatient practice. However, the quality of selection is aligned with international stewardship, as most antimicrobials belong to the WHO 'Access' category. The high incidence of non-essential prescriptions underscores the urgent need for institutional monitoring and provider education, despite praiseworthy compliance with generic naming and injection criteria.

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